eNAVIGATION 2007

Luncheon Address by Captain Michael R. Watson,
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I am pleased to talk to you today. The American Pilots' Association is also pleased to be a sponsor of this very valuable conference. APA member pilots have been attending the former AIS conferences here in Seattle since they began. Their attendance and participation is part of the piloting profession's commitment to staying in the forefront of advanced navigation technology. In fact, our association has long maintained the goal that APA member pilots will be the best-trained and most technologically proficient mariners in the world. I'm not sure how we could measure whether we have achieved that goal, but I can tell you that we work very hard at it.

I have been asked to offer some perspectives from the world of ship pilots on e-Navigation. As an opening matter, let me assure you that pilots are supporters of advanced navigation technology, extremely knowledgeable about it, and experienced practitioners in its use. It takes all the self-restraint that I can muster not to respond angrily when I read claims in some of the publications that most of you read that pilots don't understand modern shipboard technology, or lack the same quality or quantity of training as the ship's crew, or that their traditional role in directing and controlling the navigation of ships should be reevaluated due to changing technology. Such self-serving claims are absolutely untrue.

Whether through the use of their own carry-aboard electronic navigation units or of equipment installed on ships' bridges, today's pilots understand the latest types of advanced navigation technology and have first-hand experience in its uses. I would suggest to you that, with their knowledge and training, and their experience seeing all different types of ships with all different types of navigation technology, pilots are in a unique position to assess the strengths and weaknesses and the benefits and dangers, in modern navigation technology.

At an e-Navigation seminar held by IALA in London last July, Dr. Lee Alexander was giving a presentation on "Electronic Charts of the Future" and made the statement that the most innovative and advanced use of e-Nav today is being done by pilots, who are making technology do precisely what they need rather than what someone is trying to sell them. I couldn't agree with him more. Pilots bring a very practical approach to navigation technology, one firmly rooted

in what actually happens on the bridge of ship and what they need in order to make the best navigation decisions.

This then can be described as a dual attitude of pilots towards advanced navigation technology. They support and embrace technology but with a full awareness of the cautions that must surround its use. An example of that approach can be found in a set of official APA position statements on AIS and ECDIS/ECS adopted in 2004 but still valid today:

1. Although AIS and ECDIS/ECS technology is generally recognized as capable of enhancing navigation safety, there are system limitations and inaccuracies that can be further exacerbated by integrating displays or by using inaccurate source data.

2. AIS and ECDIS/ECS require operator input, which can significantly affect the accuracy of the information being broadcast or displayed, and AIS and ECDIS/ECS systems have been placed in use in many vessels with little or no formal training of the crew.

3. Individual pilotage areas are unique and may differ in the coverage or delivery of AIS and the availability of accurate chart data for ECDIS/ECS, and there are recognized limitations in the ability of installed shipboard equipment to reliably handle port-specific applications and databases.

4. The manner in which information from emerging electronic navigation technologies such as AIS and ECDIS/ECS should be used during the course of any particular pilotage assignment should be left to the independent, professional judgment of the pilot.

5. In order to make a professional judgment as to the use of information from emerging electronic navigation technologies such as AIS and ECDIS/ECS, a pilot should be familiar with the capabilities and limitations of these technologies.

6. The American Pilots' Association encourages its member pilots to be knowledgeable in the capabilities, limitations and operation of emerging electronic navigation technologies such as Automatic Identification Systems (AIS) and Electronic Charting and Display Systems (ECDIS) and other Electronic Charting Systems (ECS), including port-specific training where appropriate.

7. The American Pilots' Association encourages its member pilots to discuss the use of AIS and ECDIS/ECS in their Master – Pilot Information Exchange.

8. The American Pilots' Association encourages its member pilots to validate the information provided by AIS and ECDIS/ECS and other electronic navigation systems by traditional methods.

Those policy statements grew out of recommendations by the APA's Navigation and Technology Committee. This committee is currently chaired by Captain Jorge Viso, a member and past president of the Tampa Bay Pilots. Members of the Committee are all active pilots who find time between their piloting assignments to contribute their interest, background, and expertise in navigation technology to the piloting profession. Two weeks ago, the Committee met in Washington, DC. To give you some idea of their work, the agenda for the meeting included:

1. A system for azipod maneuvering terminology proposed by pilots in Alaska based on their experience with azipods on cruise vessels;

2. An update on developments in e-Navigation;

3. A review of Dr. Lee Alexander's recent report on pilot laptop use;

4. Recorded examples of inaccurate AIS vessel positioning information;

5. Proposed content for AIS/ECDIS training specifically designed for pilots; and

6. Review of new laptop systems and software recently put into use by APA pilot groups.

Also at that meeting, the Committee reviewed the results of an informal survey of its members concerning the state of pilot plugs and other AIS equipment recently found on ships. Information from the survey has been provided to the Coast Guard, as part of the on-going cooperation between the Coast Guard and the APA in the area of navigation technology.

According to the survey, pilots are finding pilot plugs to be operational in close to 90% of the ships they encounter. That is an improvement over the results from a similar study conducted two years ago, but pilots are still finding sub-standard installations of pilot plugs. Of the 10% of ships with problems or deficiencies in their pilot plugs, about half of the problems could be fixed by the pilot or overcome by the pilot's laptop hardware or software. These fixes include correction of reversed TX or RX wire pairs, incorrect baud rates and AD converter problems.

Most pilots report that enforcement of the pilot plug requirements by local Coast Guard offices has been effective, but not always consistent. At the

meeting, Mike Sollosi of the Coast Guard indicated that the Coast Guard has just begun to obtain pilot plug testers that should be able to detect or confirm many of most commonly reported problems. That should help.

Pilots continue to see inaccuracy in vessel positions depicted on electronic charts and other displays by AIS information. There are several sources of these errors. Some are simply due to improper setup or static data input. Others are generated by software issues or low quality or poorly maintained GPS units. With respect to erroneous AIS transmissions, pilots responding to the NAVTECH Committee survey noted that most vessels do not have an easy method to verify the AIS information that they are transmitting, particularly the vessel's position. In addition, unless a VTS center employs radar along with AIS, it will not detect many of the errors pilots have witnessed. In general, VTS systems and casualty investigators should be more cautious in their use of AIS as an indicator of vessel position.   By itself, AIS is simply not a sufficiently reliable source of vessel position information to be used as the basis for shoreside traffic intervention or casualty reconstruction.

The survey respondents offered several additional comments and suggestions for AIS:

1. Accuracy could be greatly improved by mandating DGPS for AIS position report;

2. Rate of Turn, when present, is not always delivered to the pilot plug;

3. Gyro input carried to a tenth of a degree would allow pilot laptop units to develop a useable rate of turn. This is a highly desired improvement;

4. There should be more stringent enforcement of the requirement for AC power availability near the pilot plug;

5. On tug/barge units, an additional transponder should be placed on the barge when the tug and barge are separated and not adjacent;

6. AIS carriage requirements should be expanded to include all dredges, oil field supply vessels, and public vessels when operating in port areas.

Let me close with some comments about the concept of e-Navigation and its background.

When the original e-Navigation paper was submitted by the United States and six other countries to the IMO's Maritime Safety Committee in 2005, we welcomed the idea of developing a strategy for e-Navigation and noted the proposal to take a holistic approach to modern navigation technology and

systems. We particularly approved of the idea of marrying human factors with the development of new technology. This responded to a real need. It was consistent with a growing concern among pilots and other shipboard personnel who must deal with new technology that does not always appear to offer any improvement over existing technology. Although there is much in the way of new electronic technology that excites pilots and offers new possibilities for improving situational awareness and expanding the resources available to pilots for ship navigation, other forms of advertised "advances" in navigation technology seem merely to have been developed to show what the developers can do.

New shipboard technology seems at times to be simply the product of an obsessive, and sometimes not well-thought out, drive to integrate and automate. What was needed, and still is needed, it seems to me, is for people to take a step back and ask whether a new item or system of technology actually serves any safety purpose. In other words, someone needs to ask: Will this improve safety? Will it facilitate the work of the pilot and the bridge crew? Will it provide genuinely useful information to the pilot and the bridge crew in a readily accessible format? Will it reduce the workload of the pilot and bridge crew? Will it be distracting? How will it be incorporated into navigation practices on the bridge? What kind of training will it require? How will the people on the bridge of the ship actually use it?

I am encouraged by some recent developments. First, the IMO has decided that the next step in developing its e-Nav strategy is to identify and define users' needs. This reflects a particular point made by IMO Secretary General Mitropolous that e-Navigation must take into account, and be driven by, the human element. We certainly welcome this approach and hope that pilots are included in the users whose needs will be considered.

Second, in the development of new IMO performance standards for integrated navigation systems and integrated bridge systems, the participants were directed to ensure that the standards incorporate the requirements of SOLAS Chapter V, Regulation 15. As many of you know, that regulation states that decisions made concerning bridge design, the design and arrangement of navigational systems and equipment on the bridge, and bridge procedures must be taken with the aims of facilitating the tasks to be performed by the pilot and the bridge team and of promoting safe and effective bridge resource management.

Regulation 15 is extremely important, and its underlying rationale provides a useful tool for assessing the value of shipborne technology. Although the regulation has not been widely appreciated until recently and compliance with it is admittedly difficult to verify by objective, quantitative tests, it seeks to reconcile technology with human factors. Its addition to SOLAS in 2000 was based on a recognition that navigation technology on one hand and principles of effective bridge resource management on the other hand have been moving on widely

divergent paths. For example, BRM seeks to prevent single point errors by encouraging information sharing and cross-monitoring and empowering all the personnel on the bridge to be active participants in the navigation of the ship. In the drive to integrate and automate, however, modern technology developers seem to want to limit access to information to one individual and to prevent humans on the bridge from participating in the navigation. More and more, computers are making navigational decisions, and much of the information and calculations on which the computers base their actions, as well as the actions themselves, are hidden from view.

If regulation 15 means anything, it means that technology must serve the needs of mariners, not the other way around. Technology can only do that if the developers of technology and the leaders in the e-Navigation movement seek out and listen to mariners. Pilots, as mariners with expertise in using technology under actual conditions and in the places of greatest navigational demands, should play an important role in that dialogue. Therefore, I invite the developers, the manufacturers, the vendors, the regulators, and the promoters of e-Navigation to talk to pilots. When you do, please consider pilots as your partners in this movement. We are all interested in making vessel navigation as safe, efficient, and environmentally friendly as it possibly can be.

Thank you.